CLAIMS

1. A means for optically coupling an optical fibre to an integrated circuit: the circuit including at least one optically active element; and the means for coupling comprising reflecting and receiving means for mounting on a surface of said integrated circuit, said reflecting and receiving means being adapted to receive the optical fibre into optically coupled connection therewith.

2. A means for optically coupling an optical fibre to an integrated circuit as claimed in claim 1 wherein the reflecting and receiving means has two open ends and one end is preferably adapted to receive and retain an optical fibre and the second end is preferably adapted to fit around an optically active element or elements.

3. A means for optically coupling an optical fibre to an integrated circuit as claimed in claim 1 or claim 2 wherein the reflecting and receiving means has shaped and reflective inner surfaces operable to direct light from the optical fibre onto said optically active element or elements and to direct light from said optically active elements into said optical fibre.

4. A means for optically coupling an optical fibre to an integrated circuit as claimed in claim 3 wherein the inner surfaces are curved.

5. A means for optically coupling an optical fibre to an integrated circuit as claimed in claim 3 or claim 4 wherein a gel blob is applied to said optically active element or elements so as to form a lens to assist said reflecting and receiving means in directing light from said optical fibre to said optically

active element or elements and in directing light from said optically active element or elements to said optical fibre.

6. A means for optically coupling an optical fibre to an integrated circuit as claimed in any preceding claim wherein the reflecting and receiving means is mounted on the integrated circuit by means of adhesive.

7. A means for optically coupling an optical fibre to an integrated circuit as claimed in any preceding claim wherein the integrated circuit is additionally provided with bond pads, which allow electrical connections to be made between the optically active element or elements and external circuitry.

8. A method of optically coupling an optical fibre to an integrated circuit, the integrated circuit including at least one optically active element, said coupling being achieved by the steps of: mounting on a surface of said integrated circuit reflecting and receiving means; and optically coupling said optical fibre to said reflecting and receiving means.

9. An optical data transceiver comprising: an integrated circuit comprising at least one optically active element; and a reflecting and receiving means mounted on said integrated circuit, said reflecting and receiving means for receiving and retaining the end of an optical fibre and for directing light from said optical fibre to said optically active element or elements and for directing light from said optically active element or elements to said optical fibre.

10. An optical data transceiver as claimed in claim 9 wherein the reflecting and receiving means has shaped and reflective inner surfaces

11. An optical data transceiver as claimed in claim 10 wherein the inner surfaces are curved.

12. An optical data transceiver as claimed in any one of claims 9 to 11 wherein the optical transceiver is an optical transceiver of the type comprising two optically active elements, a light emitting means and a light sensing means.

13. An optical data transceiver as claimed in any one of claims 9 to 11 wherein the optical transceiver is an optical transceiver of the type comprising a single optically active element being a light emitting means.

14. An optical data transceiver as claimed in any one of claims 9 to 11 wherein the optical transceiver is an optical transceiver of the type comprising a single optically active element being a light sensing means.

15. An optical data transceiver as claimed in any one of claims 9 to 11 wherein the optical transceiver is an optical transceiver of the type comprising three optically active elements: a light emitting means operable to emit light in response to received electrical signals; a mounting means suitable for retaining an end of an optical fibre in position adjacent to said light emitting means; a first light sensing means operable to detect light emitted by the light emitting means and reflected from the end of said optical fibre, said first light sensing means being operable to output a signal indicative of the intensity of the reflected light; a second light sensing means operable to detect light incident upon said transceiver unit from an external source via said optical fibre and output electrical signals in response thereto; and control means operable to vary the intensity of the light emitted by the light emitting means in response to the output of the first light sensing means.

16. An optical data transceiver as claimed in claim 15 wherein said optical transceiver unit is adapted to transmit light of a first wavelength and to receive light of a second wavelength.

17. An optical data transceiver as claimed in claim 15 or claim 16 wherein said light emitting means is adapted to emit light of a first wavelength and said first light sensing means is adapted such that it detects substantially only light of said first wavelength.

18. An optical data transceiver as claimed in any one of claims 15 to 17 wherein said second light sensing device is an independent light sensing device or is a portion of the first light sensing means operable to provide a distinguishable signal and which is adapted such that it detects substantially only light of said second wavelength.

19. An optical data transceiver as claimed in any one of claims 9 to 18 wherein the optical fibre is a plastic optical fibre (POF).

20. An optical data transceiver as claimed in any one of claims 9 to 19 wherein a gel blob is applied to said optically active elements so as to form a lens to assist said reflector means in directing light from said optical fibre to said optically active element or elements and to direct light from said optically active element or elements to said optical fibre.

21. An optical data transceiver as claimed in any one of claims 9 to 20 wherein the optically active elements are implemented on a single integrated circuit.

22. An optical data transceiver as claimed in any one of claims 9 to 20 wherein the optically active elements are implemented on independent integrated circuits,

said independent integrated circuits being electrically connected and physically fixed in a desired relative position.

23. An optical data transceiver as claimed in any one of claims 9 to 22 wherein the integrated circuit is additionally provided with bond pads.

24. An optical data transceiver as claimed in claim 23 wherein the integrated circuit is mounted on a substrate or a lead frame and electrical connections between said bond pads provided on said integrated circuit and external circuitry are made via said substrate or lead frame.

25. A method of manufacturing optical data transceivers comprising the steps of: providing an array of integrated circuits on a wafer, each integrated circuit incorporating at least one optically active element; providing a corresponding array of reflecting and receiving means, each reflecting and receiving means within the array operable to retain the end of an optical fibre and to direct light from said optical fibre to said optically active element or elements of one of the integrated circuits and also operable to direct light from said optically active element or elements of one of the integrated circuits to said optical fibre; aligning said array of reflecting and receiving means with said array of integrated circuits and thereby mounting said array of reflecting and receiving means in alignment with said array of integrated circuits; and separating individual optical data transceivers from the array.

26. A method of manufacturing optical data transceivers as claimed in claim 25 wherein the wafer and the array of reflecting and receiving means are separated into individual optical data transceivers by sawing or laser scribing.

27. A method of manufacturing optical data transceivers as claimed in claim 25 or claim 26 wherein the wafer and array of reflecting and receiving means are separated into optical data transceivers incorporating two or more reflecting and receiving means and two or more integrated circuits.

28. A method of manufacturing optical data transceivers as claimed in claim 25 or claim 26 wherein the array of reflecting and receiving means provide a plurality of reflecting and receiving means for a corresponding plurality of optically active elements provided on each integrated circuit.

29. A method of manufacturing optical data transceivers as claimed in any one of claims 25 to 28 wherein the method is used to manufacture optical data transceivers as claimed in any one of claims 9 to 24.

30. A method of manufacturing a packaged optical data transceiver comprising the following steps: providing an integrated circuit, the integrated circuit incorporating at least one optically active element; mounting a reflecting and receiving means on said integrated circuit, said reflecting and receiving means being operable to retain the end of an optical fibre and to direct light from said optical fibre to said optically active element or elements of one of the integrated circuits and also operable to direct light from said optically active element or elements of one of the integrated circuits to said optical fibre; and dispensing a quantity of potting compound on to the surface of said integrated circuit such that only the reflector means and said optically active elements are left uncovered.

31. A method of manufacturing a packaged optical data transceiver as claimed in claim 30 wherein the method further comprises the steps of: providing bond

pads on said integrated circuit; mounting said integrated circuit on a suitable substrate; and forming electrical connections between said bond pads and said substrate before dispensing said potting compound.

32. A method of manufacturing a packaged optical data transceiver as claimed in claim 31 wherein said potting compound is dispensed so as to cover substantially the whole of the substrate in addition to the integrated circuit.

33. A method of manufacturing a packaged optical data transceiver as claimed in claim 32 wherein the potting compound is applied in such a manner as to leave exposed bond pads or other means for electrically connecting the substrate to external circuitry.

34. A method of manufacturing a packaged optical data transceiver as claimed in claim 33 wherein contacts for external electrical connections are provided on the opposite side of the substrate to that the integrated circuit is mounted on and vias are provided in the substrate.

35. A method of manufacturing a packaged optical data transceiver comprising the following steps: providing an integrated circuit, the integrated circuit incorporating at least one optically active element; mounting a reflecting and receiving means on said integrated circuit, said reflecting and receiving means being operable to retain the end of an optical fibre and to direct light from said optical fibre to said optically active element or elements of one of the integrated circuits and also operable to direct light from said optically active element or elements of one of the integrated circuits to said optical fibre, thereby forming an assembly; inserting the assembly into a cavity of a moulding tool ensuring that at least a projection of the moulding tool is in

contact with and seals with the reflecting and receiving means; introducing a plastic mould compound into the cavity so as to encapsulate the assembly except for the portion in contact with the projection; and removing the assembly from the cavity, whereby there is an opening defined in the plastic mould encapsulating the assembly through which light may pass to the optically active element or elements.

36. A method as claimed in claim 35 wherein the method further comprises the steps of: providing bond pads on said integrated circuit; mounting said integrated circuit on a suitable lead frame; and forming electrical connections between said bond pads and said lead frame before inserting the assembly into the moulding tool.

37. A method as claimed in claim 36 wherein the peripheral portions of the lead frame are not encapsulated.

38. A method of manufacturing a packaged optical data transceiver comprising the following steps: providing an integrated circuit, the integrated circuit incorporating at least one optically active element; applying a quantity of gel to the integrated circuit to cover at least the optically active elements, thereby forming a gel-coated assembly; inserting the gel-coated assembly into a cavity of a moulding tool ensuring that at least a projection of the moulding tool is in contact with the gel-coated assembly; introducing a plastic mould compound into the cavity so as to encapsulate the gel-coated assembly except for the portion in contact with the projection; removing the assembly from the cavity, whereby there is an opening defined in the plastic mould encapsulating the assembly through which the assembly can be accessed; and mounting a

reflecting and receiving means on said integrated circuit, said reflecting and receiving means being operable to retain the end of an optical fibre and to direct light from said optical fibre to said optically active element or elements of one of the integrated circuits and also operable to direct light from said optically active element or elements of one of the integrated circuits to said optical fibre.

39. A method as claimed in claim 39 wherein the method further comprises the steps of: providing bond pads on said integrated circuit; mounting said integrated circuit on a suitable lead frame; and forming electrical connections between said bond pads and said lead frame before inserting the assembly into the moulding tool.

40. A method as claimed in claim 38 wherein the peripheral portions of the lead frame are not encapsulated.

41. A packaged optical data transceiver manufactured in accordance with the method of any one of claims 30 to 41.

42. A packaged optical data transceiver as claimed in claim 42 wherein the optical data transceiver incorporates any or all of the features of any one of claims 9 to 24.